Schedule of the lectures on biophysics – Branch General Medicine 2025-2026)

Place: Institute of Experimental Oncology, U Nemocnice 5, Lecture room 097

Week	Date	Lecture
Week 1	Tue 30.9.2025 12:35-13:50	Prof. Jirák: Structure of matter I (Atom, Basic particles,
		Antiparticles, Force interactions, Energy)
	We 01.10.2025 12:30-13:45	Prof. Jirák: Quantum Physics I (Corpuscular-wave dualism,
		Behaviour of a particle, TEM, Quantum numbers)
Week 2	Tue 07.10.2025 12:35-13:50	Prof. Jirák: Quantum Physics II (Spectrum of hydrogen
		atom, Electron structure of heavy atoms, Emission, Excitation,
		Ionization, Photoelectric effect, Luminescence, Optical
		imaging)
	We 08.10.2025 12:30-13:45	Prof. Jirák: Forces acting among atoms (Forces acting
		among atoms, Mass spectroscopy, Atomic nucleus, Binding
		energy, Mass defect, Potential barrier of atomic nucleus)
Week 3	Tue 14.10.2025 12:35-13:50	Prof. Jirák: Bioelectric phenomena I (Electric phenomena,
		Electric laws, Ohm's law, Resistance, Impedance, Wheatstone
		bridge, Permittivity, Effects of el. current, Electrotherapy)
	We 15. 10.2025 12:30-13:45	Prof. Jirák: Bioelectric phenomena II (Membrane transport,
		Membrane potential, Nernst potential, Sodium-Potassium
		pump ATP-ADP cycle, Action potential, All or none law,
		Rheobase, Chronaxie, Conduction of action potential, Ion
		channel, Principle of ECG)
Week 4	Tue 21.10.2025 12:35-13:50	MUDr. Kymplová: Bioelectric phenomena III
		(Electrodiagnostic methods and their clinical applications,
		Heart, Action potential in heart cell, Laser-Clinical
		applications)
	We 22.10.2025 12:30-13:45	RNDr. Zápotocký: Thermodynamics I (Laws of
		thermodynamics, Propagation of heat energy, Bioenergetics,
		Measurement of temperature, Calorimetry, Thermal losses)
Week 5	We 29.10.2025 12:30-13:45	RNDr. Zápotocký: Thermodynamics II (Thermodynamic
		systems, Work and heat, State quantities, Internal energy,
		Enthalpy, Entropy, Free energy, Free enthalpy, Chemical
		potential)
Week 6	Tue 04.11.2025 12:35-13:50	Prof. Jirák: Acoustics (Definition, Basic quantities,
		Doppler's effect, Ultrasound, Piezoelectric effect, Ultrasound
		imaging)
	We 05.11.2025 12:30-13:45	Assoc. Prof. Stanicová: Bioacoustics (Biophysics of hearing,
		Weber-Fechner's law, Field of hearing, Complex tomes,
		Principal of hearing)
Week 7	Tue 11.11.2025 12:35-13:50	Prof. Jirák: Molecular biophysics I (Forces acting among
		molecules, States of matter, Gaseous phase, Kinetic theory of
		gases, Dalton law, Henry law, Graham law, Equipartition
		theorem, Real gas)
	We 12.11.2025 12:30-13:45	Prof. Jirák: Molecular biophysics II (Liquid phase, Water,
		Solid phase, Change of phases, Gibbs rule of phases,
		Dispersion systems, Colloidal dispersion, Nephelometry)

Week 9 Tue 25.11.2025 12:35-13:50 Week 9 Tue 25.11.2025 12:35-13:50 Week 10 Tue 02.12.2025 12:35-13:50 Week 11 Tue 9.12.2025 12:30-13:45 Week 12 Tue 9.12.2025 12:35-13:50 Week 12 Tue 16.12.2025 12:35-13:50 Week 13 Tue 06.01.2026 12:35-13:50 Week 14 Tue 13.1.2026 12:30-13:45 Week 15 Tue 14.1.2026 12:30-13:45 Week 16 Tue 15.1.2025 12:30-13:45 Week 17 Tue 16.12.2025 12:35-13:50 Week 18 Tue 16.12.2025 12:35-13:50 Week 19 Tue 16.12.2025 12:35-13:50 Week 19 Tue 16.12.2025 12:35-13:50 Week 19 Tue 16.12.2025 12:35-13:50 Tue 16.12.2025 12:35-13:50 Week 19 Tue 16.12.2025 12:35-13	Week 8	Tue 18.11.2025 12:35-13:50	MUDr. Štěpánek: Statistical analyses (Error of measurement,
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	Week 15		